Apr 17th, 9:00 AM - 10:00 AM

Morphology of the Heart in Larvaceans (Appendicularia: Oikopleuridae)

Ernest Hixon
Illinois Wesleyan University

Elizabeth Balser, Faculty Advisor
Illinois Wesleyan University

Poster Presentation 13

MORPHOLOGY OF THE HEART IN LARVACEANS (APPENDICULARIA: OIKOPLEURIDAE)

Ernest Hixon and Elizabeth Balser*
Department of Biology, Illinois Wesleyan University

Larvaceans are small Urochordate animals that in many ways resemble the tadpole larva of other Urochordate animals, in particular those of the sea squirts. The larvaceans have a relatively large head region containing almost all of the animal's organs, and a long, flat muscular tail. A mucous house is secreted around the larvaceans head to allow for filter feeding. Existing morphological descriptions of the Oikopleuridae heart are both limited in information and incomplete. In this study we offer a new morphological description of the larvacean heart and its associated structures. Analysis of the heart was done by viewing sections of larvaceans using both light and electron microscopes, as well as analysis of video recordings of live animals. The heart appears to be a simple contractile coelomic cavity resting between the intestine and the left lobe of the stomach. An interesting and unreported aspect of the heart is that an extension of the heart coelom extends a short distance into the tail. Contractions of the heart are rapid and seem to lack directionality. The morphology of the heart is useful in defining phylogenetic relationships within the Urochordates, a subphylum within the Chordata. Two hypotheses attempt to explain the relationship between larvaceans and sea squirts. The first is that larvaceans are primitive relative to the sea squirts, and the other that larvaceans are more derived than sea squirts. The morphology of the heart of the larvacean is simpler in design than that of sea squirts and more closely resembles that of two out-groups to chordates, the Echinodermata and the Hemichordata. This evidence, in conjunction with other morphological characteristics supports the hypothesis that larvaceans evolved from a common ancestor of both groups prior to the appearance of sea squirts.